DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-006112
Date Inspected: 02-Apr-2009

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 645
OSM Departure Time: 1900
Location: Shanghai, China

CWI Name:	See Below			**CWI Present:**	☑ Yes	☐ No	
Inspected CWI report:	☐ Yes	☑ No	☐ N/A	**Rod Oven in Use:**	☑ Yes	☐ No	☐ N/A
Electrode to specification:	☑ Yes	☐ No	☐ N/A	**Weld Procedures Followed:**	☑ Yes	☐ No	☐ N/A
Qualified Welders:	☑ Yes	☐ No	☐ N/A	**Verified Joint Fit-up:**	☑ Yes	☐ No	☐ N/A
Approved Drawings:	☑ Yes	☐ No	☐ N/A	**Approved WPS:**	☑ Yes	☐ No	☐ N/A
				Delayed / Cancelled:	☐ Yes	☑ No	☐ N/A

Bridge No: 34-0006
Component: Tower Fabrication

Summary of Items Observed:
CWI Inspectors: Mr. Zhu Zhong Hai and Mr. Huang Wei

On this date CALTRANS OSM Quality Assurance (QA) Inspector Mr. Paul Dawson arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, for the purpose of monitoring welding and fabrication of the San Francisco / Oakland Bay Bridge (SFOBB) components. The QA Inspector observed the following:

OBG Bay 19

The QA Inspector observed ZPMC welder Mr. Cai Hailong, stencil 062749 is using welding procedure WPS-B-T-2133 to make flux cored fillet welds in the 3G (vertical) position on Cross Beam CB3 Side plate SP224-001 to Floor Beam FB209-001. The QA Inspector measured a welding current of approximately 200 amps and 25.0 volts. QA Inspector observed the base material had been preheated with a torch prior to welding. Items observed by the QA Inspector appear to comply with project specifications.

The QA Inspector observed ZPMC welder Mr. Chen Houshan, stencil 062750 is using welding procedure WPS-B-T-2133 to make flux cored fillet welds in the 3G (vertical) position on Cross Beam CB3 Side plate SP216-001 to Floor Beam FB209-001. The QA Inspector measured a welding current of approximately 210 amps and 25.0 volts. QA Inspector observed the base material had been preheated with a torch prior to welding. Items observed by the QA Inspector appear to comply with project specifications.

The QA Inspector observed ZPMC welder Mr. Wang Yong, stencil 062807 is using welding procedure WPS-B-T-2133 to make flux cored fillet welds in the 3G (vertical) position on Cross Beam CB3 Side plate SP224-001 to Floor Beam FB210-002. The QA Inspector measured a welding current of approximately 220 amps and 25.0 volts. QA Inspector observed the base material had been preheated with a torch prior to welding. Items observed by the QA Inspector appear to comply with project specifications.

Procedure Qualification

American Bridge/Fluor representative Mr. Jeff Evans informed the QA Inspector that ZPMC is going to perform welding procedure qualification testing today.

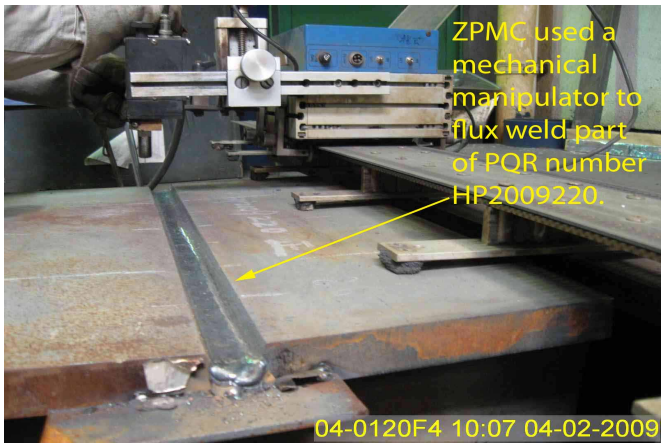
1G (Flat) Procedure Qualification Test HP2009220

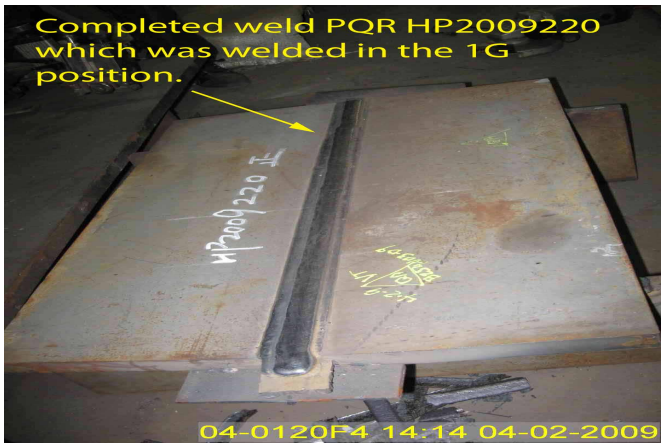
ABF representative Mr. Wang Zhong Yuan presented the QA Inspector with copy of preliminary ZPMC welding procedure specification PWPS-B-T-2232T-1 which provides the parameters for welding a groove weld in the 1G (flat) position using the semi automated flux cored welding process. The welding procedure specification stipulates use of 1.4 mm diameter Supercored 71H / E71T-1, AWS 5.20 welding electrode and the use of ceramic backing material. The supplied certified material test report for the base material indicates the plate being welded is 30 mm thick ASTM A709-50T-2 steel. ZPMC conducted the procedure qualification test in the ZPMC welding lab. The QA Inspector observed ZPMC welder Mr. Jin Rong, stencil 066471 had manually completed the root pass of the weld prior to the arrival of the QA Inspector. The QA Inspector observed ZPMC CWI Mr. Huang Wei and ABF representative Mr. Wang Zhong Yuan monitoring this welding and measuring the welding current, voltage, travel speed and base material interpass temperature for each welding pass. After completion of seven manual weld passes Mr. Jin Rong used a motor driven welding machine which holds the flux cored welding head manipulator and runs along a magnetically anchored rail adjacent to the groove weld axis. This motor driven technique was used for the next three weld passes and then the motor driven machine manipulator stopped functioning properly. After a lunch break the QA Inspector observed the semi automated motor driven welding machine was being used by Mr. Jin Rong to complete of the remaining weld passes. A total of thirteen welding passes were made to complete this groove weld. The QA Inspector observed Mr. Jin Rong used a grinder to grind areas along the length of the weld several times during this procedure qualification test. During the groove welding ZPMC CWI Mr. Huang Wei and ABF representative Mr. Wang Zhong Yuan recorded an average welding current of approximately 227.7 amps, 28.0 volts, a travel speed of 121.7 mm per minute and a heat input of 3.14 kJ/mm. Mr. Huang Wei used a laser temperature measuring device to monitor the base material temperature prior to and during the welding of the plate. Following completion of the welding Mr Wei informed the QA Inspector that the weld is visually acceptable. The QA Inspector performed random visual inspections and confirmed the weld appears to comply with project specifications and AWS D1.5 welding procedure specification section 5.0. ZPMC assigned PQR number HP2009220 to this weld test and the QA Inspector assigned lot number B254-003-009 to the welding of the 1G Weld Procedure Qualification test plate. See the photographs below for additional information.

3G (Vertical) Procedure Qualification Test HP2009221

ABF representative Mr. Wang Zhong Yuan presented the QA Inspector with copy of preliminary ZPMC Welding Procedure Specification (WPS) PWPS-B-T-2233T-1 which provides the parameters for welding a groove weld in the 3G (vertical) position using the semi automated flux cored welding process. The welding procedure

specification stipulates use of 1.4 mm diameter Supercored 71H / E71T-1, AWS 5.20 welding electrode and the use of ceramic backing material. The supplied certified material test report for the base material indicates the plate that was tacked together for welding is 30 mm thick ASTM A709-50T-2 steel. The PQR plate appears to have an included bevel angle of 45 degrees and a root opening of approximately 11 mm. ZPMC conducted the Weld Procedure Qualification test in the ZPMC welding lab. The QA Inspector observed ZPMC CWI Mr. Huang Wei and ABF representative Mr. Wang Zhong Yuan monitoring this welding and measuring the welding current, voltage, travel speed and base material interpass temperature for the root pass. The QA Inspector observed ZPMC welder Mr. Jin Rong, stencil 066471 manually completing the root pass and then he ground several areas of the root pass. The QA Inspector observed a welding current of approximately 200 amps and 25 volts during the welding of this root pass. At around 1600 hours welding of this procedure qualification test plate was stopped for the day and Mr. Huang Wei informed the QA Inspector the remainder of this Weld Procedure Qualification Test Plate will be completed tomorrow. Items observed by this QA Inspector appear comply with project specifications and AWS D1.5 welding procedure specification section 5.0.





Summary of Conversations:

See above.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Serge Sinevod phone: 134-8257-0045 , who represents the Office of Structural Materials for your project.

Inspected By:	Dawson,Paul	Quality Assurance Inspector
Reviewed By:	Clifford,William	QA Reviewer